Adult Vaccination: Economics, Study Example, and Future Research

Margaret S. Coleman
PhD, Economics
zby5@cdc.gov

Presented NVAC February 2008

Outline

- Lit Review
- Philosophical collision
- What does ‘X’ cost vs. what does ‘It’ cost?
- How to answer cost questions
- What does it cost to deliver adult influenza vaccinations in a medical practice? 2001
- Methodological challenges
  - Methods
- 2001 results, 2007 update
- Discussion
- Examples of potential studies
- Conclusions

Literature Review

- C/E vaccines - 16:
- Delivery costs in adult practices - 1
- Adult WTP insurance vaccine coverage - 1
- C/E programs - 2
- Review adult vaccine finance - 1
- Call for broader research (Zurich) - 1
  - C/E vaccines too dominant
  - Re-focus some research on program

Philosophical Differences

- Epidemiology: Subject driven, 1 disease or vaccine, one result, long established and accepted methods
- Economics: Theory driven, theories applied to multiple subjects, many branches of economics develop (sometimes) different methods, e.g., macro, micro, labor, agriculture …
  - Economic evaluation one tool of economic analysis
  - Health economics can borrow from other branches of economics

“What does ‘X’ Cost?” vs. “What does ‘IT’ Cost?”

- ‘X’ (marks the spot) = disease or vaccine
- ‘It’ has multiple, changing parts; e.g., Pediatric vaccine delivery ≠ Adult vaccine delivery
- ‘It’ is more complex than “X”
- Cost is relational, complex studies yield complex results
  - $1 from a budget of $100 vs. $10,000
  - CONTEXT: what do you get for $1, what do you WANT for $1 – is ‘it’ worth the expenditure?
    - Context of “it” will probably NOT be reduction in morbidity or mortality, rather other intermediate measures, e.g., feasibility of delivering vaccines
  - Perspective – Answers to ‘it’ questions make more sense from individual stakeholder perspectives, e.g., Medical provider perspective ≠ insurer perspective ≠ government perspective

Answering “Cost to…?” for Adult Vaccines

- Cost to whom?
- “Whom?” answers some data parameters BUT
- Adult complications:
  - Vaccines delivered multiple venues
  - Connection with providers tenuous
  - Lack of uniform insurance coverage
  - Schedule less uniform, population more diverse
- Again, complex issues produce complex answers

Q: What are the total costs to deliver influenza vaccines in adult medical practices?

- Landmark study, gap in knowledge, but challenges:
  - Study as structured followed patients, not staff
  - No information available about nonclinical labor
  - “Denominators” were missing:
    - Total numbers of patients
    - Total expenditures and receipts
    - Numbers and types of clinical and nonclinical staff

Methods – Slide 1 of 3

- No physician labor, in 2001, Medicare administrative fees did not include a component for physician labor
- 2 types of visits – unscheduled walk ins and scheduled appointments for vaccination only
  - Most vaccinations delivered in with other services
- Original Sources:
  - Occupational Checklist of Patient Encounters – Senior (OCPE), developed by John Fontanesi UCal San Diego
    - Patient/clinical staff interaction
  - Office Manager's Survey (OMS), developed by Margaret Coleman, CDC
    - Labor composition and vaccine ordering

Methods – Slide 2 of 3

- **Cost-per-vaccinated-adult = labor + overhead + supplies**
- Clinical labor = RN, LPN, MA
  - Including set-up and record keeping, 11 minutes scheduled visit, 5 minutes walk in
- Nonclinical Labor
  - Average time 38 minutes of nonclinical labor time per patient - insurance checking, billing, reminders, record pulling and filing, etc.
    - Business hires enough labor for anticipated work load
- Labor composition – Monte Carlo simulation to determine average numbers of employees
  - # physicians: 1-2 = solo/partner, 3-4 = small, 5-6 = medium, 7-10 = large, and 11-18 = corporate
- Overhead – non labor costs – from the Medical Group Management Association

Methods – Slide 3 of 3

- Assigned per-patient overhead based on assumed numbers of physicians and patients
  - Complex formula available on request
    - Zby5@cdc.gov
- Supplies were vaccine and syringes, shipping and handling, large purchase discount and small purchase penalty

Results: Cost of an Influenza Shot to a Medical Practice and Expense/Payment Gap

	Scheduled Visit				Walk-in Clinic			
Pract Size	Shot Cost 2001	Shot Cost 2007	Margin 2001	Margin 2007	Shot Cost 2001	Shot Cost 2007	Margin 2001	Margin 2007
Solo/ Part	$46.27	$55.06	**($34.56)**	**($22.51)**	$39.79	$47.35	**($28.08)**	**($14.80)**
Small	$34.56	$41.13	**($22.85)**	**($8.58)**	$26.00	$30.94	**($14.29)**	**$1.61**
Med	$27.77	$33.05	**($16.06)**	**($0.50)**	$21.52	$25.61	**($9.81)**	**$6.94**
Large	$25.22	$30.01	**($13.51)**	**$2.54**	$19.29	$22.96	**($7.58)**	**$9.59**
Corp	$19.58	$23.30	**($7.87)**	**$9.25**	$13.87	$16.51	**($2.16)**	**$16.04**

Medicare payment rate for an influenza vaccination **2001 = $11.71, 2007 = $32.55** **

**Includes component for physician labor

Discussion

- Study **begins** to answer what the costs are to provide adult vaccines, more needed
- Study results only hold as long as the assumptions continue to be the same
  - E.g., we assumed that a scheduled visit was for vaccination only, in reality most adults go to their doctor for multiple reasons
- More data are needed to make fewer assumptions

Replacing Assumptions with Data Filling in Gaps in Knowledge

- Add physician labor
  - Amortize original advice
- Follow clinical staff AND patients
- Time nonclinical staff functions
  - Do they vary with type of medical service?
- Collect data on:
  - Office staff composition
  - Salaries and benefits
  - Expenses and receipts
    - Medical Group Management Association survey small sample size sub specialties
- Develop patient flow measures, e.g., number of available visit slots and time allotted

Partial List Pediatric Studies Underway Adolescent Study Proposed

- Missing data can be collected
  - Szilagyi – office staff composition, patient flow, NY State
  - Freed – prices paid, and reimbursement collected
  - Glazner – practice costs to vaccinate, Denver
  - Coleman – office staff composition, patient flow, staff and physician salaries and benefits, Georgia
  - Lieu – costs to deliver pediatric vaccinations
  - Stokley – proposed study of adolescent receipt of HPV vaccine in Retail Based Clinics (RBC), and the RBC business model

Studies to Address Gaps in Knowledge: Example I & II

- Per-shot delivery costs in 3 venues: private primary care practices; work places; RBCs
  - Why per shot? Adults unlikely to receive multiple vaccines at one time
  - Delivery costs will vary with geographic location rather than type of vaccine
    - Develop uniform questionnaire to administer in multiple locations
    - Regional studies, for example, NYC-DC-Boston or Upper Midwest, rural, urban, suburban
- Methods research to determine how to conduct more streamlined cost studies

Studies to Address Gaps in Knowledge: Examples III & IV

- Different types of medical practices have different cost profiles
  - Compare the business profiles/cost structures of delivering vaccines
- Study the C/E of adult vaccination in multiple workplace venues
  - Probably more C/E when workers need to be replaced if off the job (e.g., firefighters or nurses or assembly line workers)

Conclusions

- Economic studies of adult vaccination need to be tailored to adults
- Apply broader economic analysis to system studies
- Complex questions require complex studies, but the results are worth it
- Study uses - inform policy decisions, encourage stakeholder communication